

CLAIMS:

1. Antenna arrangement having a number of antennas for different functions and frequencies for a vehicle with a vehicle outer skin, wherein the antennas are arranged in structural cut-outs in at least one of the vehicle outer skin and in panelling elements which are mounted on the vehicle outer skin.

2. Antenna arrangement according to Claim 1, wherein at least one of the antennas is arranged in a ventilation opening which is embodied as a cut-out.

3. Antenna arrangement according to Claim 1, wherein at least one of the antennas is arranged in a cut-out due to a joint in a region of joints of the vehicle outer skin.

4. Antenna arrangement according to Claim 2, wherein at least one of the antennas is arranged in a cut-out due to a joint in a region of joints of the vehicle outer skin.

5. Antenna arrangement according to claim 1, wherein the cut-out is formed by a slot in the vehicle outer skin, the slot being dimensioned in such a way that a slot antenna is formed.

6. Antenna arrangement according to claim 2, wherein the cut-out is formed by a slot in the vehicle outer skin, the slot being dimensioned in such a way that a slot antenna is formed.

7. Antenna arrangement according to claim 3, wherein the cut-out is formed by a slot in the vehicle outer skin, the slot being dimensioned in such a way

that a slot antenna is formed.

8. Antenna arrangement according to claim 4, wherein the cut-out is formed by a slot in the vehicle outer skin, the slot being dimensioned in such a way that a slot antenna is formed.

9. Antenna arrangement according to claim 1, wherein a panelling element is embodied as an element which is mounted on the vehicle outer skin in a planar fashion, and wherein at least one of the antennas is arranged in a structural cut-out in said panelling element.

10. Antenna arrangement according to claim 2, wherein a panelling element is embodied as an element which is mounted on the vehicle outer skin in a planar fashion, and wherein at least one of the antennas is arranged in a structural cut-out in said panelling element.

11. Antenna arrangement according to claim 3, wherein a panelling element is embodied as an element which is mounted on the vehicle outer skin in a planar fashion, and wherein at least one of the antennas is arranged in a structural cut-out in said panelling element.

12. Antenna arrangement according to claim 4, wherein a panelling element is embodied as an element which is mounted on the vehicle outer skin in a planar fashion, and wherein at least one of the antennas is arranged in a structural cut-out in said panelling element.

13. Antenna arrangement according to claim 5, wherein a panelling element is embodied as an element which is mounted on

the vehicle outer skin in a planar fashion, and wherein at least one of the antennas is arranged in a structural cut-out in said panelling element.

14. Antenna arrangement according to claim 1, wherein at least one panelling element is formed a one of a decorative element and a ram bar or strip; and wherein at least one of the antennae is arranged in a structural cut-out in said panelling element.

15. Antenna arrangement according to claim 2, wherein at least one panelling element is formed a one of a decorative element and a ram bar or strip; and wherein at least one of the antennae is arranged in a structural cut-out in said panelling element.

16. Antenna arrangement according to claim 3, wherein at least one panelling element is formed a one of a decorative element and a ram bar or strip; and wherein at least one of the antennae is arranged in a structural cut-out in said panelling element.

17. Antenna arrangement according to claim 4, wherein at least one panelling element is formed a one of a decorative element and a ram bar or strip; and wherein at least one of the antennae is arranged in a structural cut-out in said panelling element.

18. Antenna arrangement according to claim 5, wherein at least one panelling element is formed a one of a decorative element and a ram bar or strip; and wherein at least one of the antennae is arranged in a structural cut-out in said panelling element.

Q 17 19. Antenna arrangement according to claim 9, wherein at least one panelling element is formed a one of a decorative element and a ram bar or strip; and wherein at least one of the antennae is arranged in a structural cut-out in said panelling element.

20. Antenna arrangement according to one claim 1, wherein at least one antenna is formed by a panelling element itself.

21. Antenna arrangement according to one claim 2, wherein at least one antenna is formed by a panelling element itself.

22. Antenna arrangement according to one claim 3, wherein at least one antenna is formed by a panelling element itself.

23. Antenna arrangement according to one claim 4, wherein at least one antenna is formed by a panelling element itself.

24. Antenna arrangement according to one claim 5, wherein at least one antenna is formed by a panelling element itself.

25. Antenna arrangement according to one claim 9, wherein at least one antenna is formed by a panelling element itself.

26. Antenna arrangement according to one claim 14, wherein at least one antenna is formed by a panelling element itself.

a1 27. A passenger vehicle comprising:  
a vehicle outer skin,

panelling elements mounted on the vehicle outer skin, and

a plurality of antennas having respective different functions and frequency characteristics,

wherein the antennas are disposed at the vehicle outer skin and panelling elements in a manner which does not interfere with an outer appearance of the vehicle.

28. A passenger vehicle according to claim 27, wherein said antennae includes antennas for:

- (a) AM radio reception;
- (b) FM radio reception; and
- (c) a vehicle locking system

29. A passenger vehicle according to claim 28, wherein said antennas includes antennae for:

a GPS system.

30. A passenger vehicle according to claim 28, wherein said antennas includes antennae for:

a mobile telephone.

31. A passenger vehicle according to claim 28, wherein said antennas includes antennae for:

a satellite radio.

32. A passenger vehicle according to claim 28, wherein said antennas includes antennae for:

a distance determining radio system.

33. A method of making a passenger vehicle comprising:  
placing a vehicle outer skin over a vehicle frame,  
mounting panelling elements on the vehicle outer skin, and  
installing a plurality of antennas having respective different functions  
and frequency characteristics,

wherein the installing of the antennas includes disposing the antennas  
at the vehicle outer skin and panelling elements in a manner which does not  
interfere with an outer appearance of the vehicle.

34. A method according to claim 33, wherein said antennae includes  
antennas for:

- (d) AM radio reception;
- (e) FM radio reception; and
- (f) a vehicle locking system

35. A method of making a passenger vehicle according to claim 33,  
wherein said installing includes forming at least one of said antennas as a slot  
antenna disposed in a joint between two parts of the outer skin.

36. A method of making a passenger vehicle according to claim 33,  
wherein said installing includes embedding at least one of said antennas in a  
respective panelling element.

37. A method of making a passenger vehicle according to claim 33,  
comprising sealing off an outwardly facing side of respective ones of said antennas  
with a cover which is permeable to electromagnetic waves operating on the  
antennas.

a/  
cut.

10093630 001500